Amendments to the Drawings:

The attached replacement sheets include changes to FIGS. 1-2 and 4. These sheets, which include FIGS. 1-4, replace the original sheets that included FIGS. 1-4.

In FIG. 1 and FIG. 4, symbols used for isolators have been changed to canonical symbols. In FIG. 2, units have been added to the axes. The units are standard units known to those of ordinary skill in the art. It is submitted that for each of these changes, there is no new matter entered.

Attachments: Two Replacement Sheets

REMARKS

Drawings

The drawings are objected to because the axes on the graph in Fig. 2 are neither quantified, nor qualified with units. In addition, the symbols used for isolators in the present application are non-canonical and must be changed.

In response to these objections, applicants have amended Fig. 2 by adding appropriate units thereto. In addition, the symbols used for isolators in Figs. 1 and 4 have been changed.

Regarding quantities of the axes in Fig. 2, applicants submit that the drawing is used in order to explain the relationship wherby **the output power of the first output end is identical to the output power of the second output end when the erbium-doped fiber has a predetermined length.** In addition, the degree to which the erbium-doped fiber is doped with erbium affects the particular performance characteristics of the erbium-doped fiber. Accordingly, the length of the erbium-doped fiber does not a definite value. Therefore, for the purposes of illustrating key characteristics of the relationship between output power of the broadband light source and a length of the erbium-doped fiber, applicant respectfully submits that it is not necessary to mark the quantities of the axes in Fig. 2.

Claim Rejections under 35 U.S.C. 101

Claims 1-7 are rejected under 35 U.S.C. 101 because the disclosed invention is inoperative and therefore lacks utility.

In response to these rejections, applicants respectfully submit that the

claimed invention does have utility, for the following reasons:

The present invention is about an amplified spontaneous emission (ASE) light source. The ASE light source includes a pump light, a WDM device, an erbium-doped fiber, and a first and a second optical isolators. **The pump light having a wavelength of 980 nm** excites the erbium-doped fiber to produce broadband light having a wavelength of 1550nm. **A part of the 1550nm wavelength light passes through the second optical isolator and is exported via a second output end. A remaining part of the 1550nm wavelength light is coupled to the WDM device, transmitted to the first optical isolator, and exported via a first output end.**

The 980nm wavelength of the pump light is different from the 1550nm wavelength of the two output ends. A rare earth-doped optical fiber has **an amplification characteristic capable of yielding a high gain at a certain wavelength with incident pumping light within a certain range of wavelengths**. **The present invention does not describe a doped fiber that may amplify light at the same frequency as the pumping light.** Accordingly, the present invention is not inoperative.

Examiner cites that U.S. 5,982,973 introduces a planar optical waveguide device. However, an optical waveguide in general includes different categories of optical waveguides. **A doped fiber belongs to a category of cylindrical waveguides, which are one kind of optical waveguide**.

The ASE light source of the present invention may **be used in testing optical communication systems and optical passive devices**. Further, the ASE light source can **provide double bandwidth output and minimize power loss**. Therefore the utility of the present invention is specific, substantial, and credible. A person of ordinary skill in the art would appreciate the invention is useful based on the described characteristics. In summary, it is submitted that the present invention is operative and has a utility.

Claim Rejections under 35 U.S.C. 112

Claims 1-7 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement.

Applicants refer to and rely on the above assertions regarding utility of claims 1-7 under 35 U.S.C. 101. For similar reasons, applicants respectfully submit that the specification enables one skilled in the art to make and/or use the invention.

Claim 7 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In response, applicants have canceled claim 7 without prejudice.

Claim Rejections under 35 U.S.C. 103

Claims 1 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Falquier et al. (US 6,429,965) in view of Hecht.

In response, applicants respectfully traverse for the following reasons:

Regarding claims 1 and 6, these recite a broadband light source which includes a pump laser, a lanthanide series element-doped fiber (claim 1) or an erbium-doped fiber (claim 6), a WDM device, and a first and a second optical isolators. **The fiber has a predetermined length.** The WDM has at least three ports, and a first and a second port of the three ports respectively connect with the pump laser and the fiber. The first isolator connects with the third port of the WDM device, and **the second isolator connects with the fiber**. The pump light is coupled to the fiber by the WDM device. The pump light is amplified by the fiber. **A part of the amplified light directly passes through the second optical isolator and is exported. A remaining part of the amplified light is reflected and coupled to the first isolator by the WDM device and**

exported.

Falquier discloses a superfluorescent source which includes an optical coupler, a doped fiber, an isolator. An object of Falquier is to reduce polarization-dependent gain, because the polarization-dependent gain has significant deleterious effects, as described in column 7, lines 40-45. Accordingly, Falquier describes many embodiments, as seen in Figs. 1-19, in order to resolve the above problem. Thus, Falquier requires that the light is unpolarized optical radiation, which is obtained by means of a depolarizer, a fiber depolarizer, polarization-maintaining, or a single-polarization fiber. Therefore, the various structures of Falquier are directed to obtaining reduced polarization-dependent gain. However, the present invention is directed to achieving a double-port output. The different objects of Falquier and the present invention correspondingly determine different roles that the elements of Falquier and the present invention have.

In addition, Falquier also fails to disclose that the fiber 118' is an export path. It would be improper to assume that the fiber 118' routes the outputted light. Indeed, Falquier describes that one end 1470 of the pump output end of the EDF 118' of Fig. 16 is optically terminated, as seen in column 19, line 40-45.

Further, Falquier fails to disclose a second isolator. Although Hecht teaches that isolators are commonly used at the output of amplifiers in order to mitigate Brillouin scattering, a person of ordinary skill in the art would not have derived the broadband light source of the present invention from a consideration of Falquier in view of Hecht.

Moreover, the present invention ingeniously utilizes a source of a problem as part of a remedy to achieve a desired objective. That is, the present invention makes use of the erbium-doped fiber's predetermined length being such that first and second optical isolators can achieve a same output optical power. Conventional broadband light source devices commonly use one end as the output end so as to obtain maximum optical

output power of the end and also maintain bandwidth. However, the output power of the other end is generally wasted. Falquier does not describe or suggest a double port output, and neither does Falquier in view of Hecht. The present invention provides a hitherto unappreciated advantage of a light source having two output ports, instead of light power being wasted at one end of the light source. While the remedy of the present invention may seem obvious once the source of the problem is identified and utilized, it is not permissible to use hindsight when considering the issue of unobviousness at the time the invention was made. Thus, the present invention as a whole is unobvious over the art cited.

For at least the above reasons, applicants submit that Falquier in view of Hecht do not teach or suggest the invention as currently set forth in claims 1 and 6. Claims 1 and 6 are submitted to be unobvious and patentable under 35 U.S.C. 103 over Falquier in view of Hecht. New claim 8 depends directly from claim 6. Applicants submit that new claim 8 should also be patentable under 35 U.S.C. 103 over Farquier in view of Hecht.

Claims 2 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Falquier et al. (US 6,429,965) in view of Hecht.

In response, applicants refer to and rely on the above assertions regarding patentability of claim 1 under 35 U.S.C. 103 over Farquier in view of Hecht. For similar reasons, claims 2 and 5 are submitted to be patentable under 35 U.S.C. 103 over Farquier in view of Hecht.

Claims 3 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Falquier et al. (US 6,429,965) in view of Hecht and further in view of Griffiths.

In response, applicants refer to and rely on the above assertions regarding patentability of claim 1 under 35 U.S.C. 103 over Farquier in

view of Hecht. Applicants acknowledge that Griffiths provides various scientific principles. However, as asserted above, **claim 1 of the present invention makes use of the erbium-doped fiber's predetermined length being such that first and second optical isolators can achieve a same output optical power, and provides a hitherto unappreciated advantage of a light source having two output ports instead of light power being wasted at one end of the light source**. The scientific principles of Griffiths do not provide any additional teaching to the teachings of Farquier in view of Hecht which might have led one of ordinary skill in the art to provide the invention of claim 1. On this basis, claims 3 and 4 should be allowable as being dependent on independent claim 1.

New Claims

Regarding claim 9, this recites a broadband light source which includes a pump laser, a lanthanide series element-doped fiber, a WDM device, and a first and a second optical isolators. **The fiber has a predetermined length**. The WDM has at least three ports, and a first and a second port of the three ports respectively connect with the pump laser and the fiber. The first isolator connects with the third port of the WDM device, and the second isolator connects with the fiber. The pump light is coupled to the fiber by the WDM device. The pump light is amplified by the fiber. A forward amplified light directly passes through the second optical isolator and is exported. A backward amplified light is reflected and coupled to the first isolator by the WDM device and exported. **The predetermined length of the doped fiber is such that the first and second optical isolators can achieve a same output optical power**.

Falquier fails to disclose that the fiber 118' thereof is an export path. It would be improper to assume that the fiber 118' routes the outputted

light. Indeed, Falquier describes that one end 1470 of the pump output end of the EDF 118' of Fig. 16 is optically terminated, as seen in column 19, line 40-45.

In addition, Falquier fails to disclose the predetermined length of the doped fiber is such that the first and second optical isolators can achieve a same output optical power.

Further, Falquier fails to disclose a second isolator. Although Hecht teaches that isolators are commonly used at the output of amplifiers in order to mitigate Brillouin scattering, a person of ordinary skill in the art would not have derived the broadband light source of the present invention from a consideration of Falquier in view of Hecht.

Moreover, the present invention ingeniously utilizes a source of a problem as part of a remedy to achieve a desired objective. That is, the present invention makes use of the erbium-doped fiber's predetermined length being such that first and second optical isolators can achieve a same output optical power. Conventional broadband light source devices commonly use one end as the output end so as to obtain maximum optical output power of the end and also maintain bandwidth. However, the output power of the other end is generally wasted. Falquier does not describe or suggest a double port output, and neither does Falquier in view of Hecht. The present invention provides a hitherto unappreciated advantage of a light source having two output ports, instead of light power being wasted at one end of the light source. While the remedy of the present invention may seem obvious once the source of the problem is identified and utilized, it is not permissible to use hindsight when considering the issue of unobviousness at the time the invention was made. Thus, the present invention as a whole is unobvious over the art cited.

For at least the above reasons, applicants submit that Falquier in view of Hecht do not teach or suggest the invention as currently set forth in claim 9. Claim 9 is submitted to be unobvious and patentable under 35

U.S.C. 103 over Falquier in view of Hecht. New claims 10-12 depend directly from claim 9. Applicants submit that new claims 10-12 should also be patentable under 35 U.S.C. 103 over Farquier in view of Hecht.

In view of the above amendments and remarks, the subject application is believed to be in a condition for allowance, and an action to such effect is earnestly solicited.

Respectfully submitted,

Lin et al.

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